

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Tadashi Horie (Reg. No. 40,437) on March 5th 2010.

The application has been amended as follows:

CLAIMS:

1-30. (Cancelled)

31. (Currently Amended) A decoding process comprising:

computer implemented steps performed by a processor of a video data decoder to implement the following steps:

receiving a block of coefficients relating to a block of video information to be displayed;

scaling the block of received coefficients to inversely quantize the block of received coefficients; and

applying a vertical transform and a horizontal transform to the block of scaled coefficient, in order to reconstruct a signal of the block of video information for display of the video signal, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a ~~transform~~ transpose thereof.

32. (Cancelled)

33. (Original) The decoding process defined in Claim 31 wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction and shift operations.

34. (Cancelled)

35-36. (Cancelled)

37. (Currently Amended) A computer-implemented decoder for decoding a block of coefficients relating to a block of video information to be displayed, the decoder comprising:
a scaler configured to scale the block of received coefficients to inversely quantize the block of received coefficients; and

an inverse transformer to apply a vertical transform and a horizontal transform to the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a ~~transform~~ transpose thereof.

38. (Cancelled)

39. (Original) The decoder defined in Claim 37 wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction and shift operations.

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40. (Cancelled)

41. (Currently Amended) A computer-readable medium, wherein the computer-readable medium is hardware, storing instructions which, when executed by a processor of a video data decoder, cause the processor to:

receive a block of coefficients relating to a block of video information to be displayed;
scale the block of received coefficients to inversely quantize the block of received coefficients; and

apply a vertical transform and a horizontal transform to the block of scaled coefficients, in order to reconstruct a signal of the block of video information for display of the video signal, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a ~~transform~~ transpose thereof.

42. (Cancelled)

43. (Previously Presented) The computer-readable medium defined in Claim 41 wherein instructions to cause the system to apply the transform comprise instructions which, when executed by the system, cause the system to compute the transform using only a sequence of addition, subtraction and shift operations.

44. (Cancelled)

45. (Currently Amended) A decoder for decoding a block of coefficients relating to a block of video information to be displayed, the decoder comprising:

means for scaling a block of coefficients to inversely quantize the block of received coefficients; and

means for applying a vertical transform and a horizontal transform to the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a ~~transform~~ transpose thereof.

46-64. (Canceled)

65. (Previously Presented) A decoding method comprising:

computer implemented steps performed by a processor of a video data decoder to implement performing a horizontal transform and a vertical transform on each row and column of an 8x8 block of scaled transform coefficients, using a one-dimensional inverse transform, in a manner using a sequence of only addition, subtraction and shift operations, wherein basis vectors of the vertical and horizontal transforms comprise the following five column vectors:

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$$\begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 1/2 \\ -1/2 \\ -1 \\ -1 \\ -1/2 \\ 1/2 \\ 1 \end{bmatrix}, \begin{bmatrix} 10/8 \\ -3/8 \\ -12/8 \\ -6/8 \\ 6/8 \\ 12/8 \\ 3/8 \\ -10/8 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \\ -1 \\ 1 \\ 1 \\ -1 \\ -1 \\ 1 \end{bmatrix} \text{ and } \begin{bmatrix} 6/8 \\ -12/8 \\ 3/8 \\ 10/8 \\ -10/8 \\ -3/8 \\ 12/8 \\ -6/8 \end{bmatrix}.$$

66. (Currently Amended) The decoding method according to claim 65, wherein the basis vectors are:

$$\begin{bmatrix} 1 & 12/8 & 1 & 10/8 & 1 & 6/8 & 1/2 & 3/8 \\ 1 & 10/8 & 1/2 & -3/8 & -1 & -12/8 & -1 & -6/8 \\ 1 & 6/8 & -1/2 & -12/8 & -1 & 3/8 & 1 & 10/8 \\ 1 & 3/8 & -1 & -6/8 & 1 & 10/8 & -1/2 & -12/8 \\ 1 & -3/8 & -1 & 6/8 & 1 & -10/8 & -1/2 & 12/8 \\ 1 & -6/8 & -1/2 & 12/8 & -1 & -3/8 & 1 & -10/8 \\ 1 & -10/8 & 1/2 & 3/8 & -1 & 12/8 & -1 & 6/8 \\ 1 & -12/8 & 1 & -10/8 & 1 & -6/8 & 1/2 & -3/8 \end{bmatrix}.$$

or multiples thereof or a ~~transform~~ transpose thereof.

67. (Previously Presented) A decoder for decoding a block of coefficients relating to a block of video information, the decoder comprising:

a processor of a computer system executing program steps to implement an inverse transformer that performs a horizontal transform and a vertical transform on each row and column of an 8x8 block of scaled transform coefficients, using a one-dimensional inverse transform, in a manner using a sequence of only addition, subtraction and shift operations, wherein basis vectors of the vertical and horizontal transforms comprise the following five columns:

$$\begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 1/2 \\ -1/2 \\ -1 \\ -1 \\ -1/2 \\ 1/2 \\ 1 \end{bmatrix}, \begin{bmatrix} 10/8 \\ -3/8 \\ -12/8 \\ -6/8 \\ 6/8 \\ 12/8 \\ 3/8 \\ -10/8 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \\ -1 \\ 1 \\ 1 \\ -1 \\ -1 \\ 1 \end{bmatrix} \text{ and } \begin{bmatrix} 6/8 \\ -12/8 \\ 3/8 \\ 10/8 \\ -10/8 \\ -3/8 \\ 12/8 \\ -6/8 \end{bmatrix}.$$

68. (Currently Amended) The decoder according to claim 67, wherein the basis vectors are:

$$\begin{bmatrix} 1 & 12/8 & 1 & 10/8 & 1 & 6/8 & 1/2 & 3/8 \\ 1 & 10/8 & 1/2 & -3/8 & -1 & -12/8 & -1 & -6/8 \\ 1 & 6/8 & -1/2 & -12/8 & -1 & 3/8 & 1 & 10/8 \\ 1 & 3/8 & -1 & -6/8 & 1 & 10/8 & -1/2 & -12/8 \\ 1 & -3/8 & -1 & 6/8 & 1 & -10/8 & -1/2 & 12/8 \\ 1 & -6/8 & -1/2 & 12/8 & -1 & -3/8 & 1 & -10/8 \\ 1 & -10/8 & 1/2 & 3/8 & -1 & 12/8 & -1 & 6/8 \\ 1 & -12/8 & 1 & -10/8 & 1 & -6/8 & 1/2 & -3/8 \end{bmatrix}$$

or multiples thereof or a transpose thereof.

69. (Previously Presented) An article of manufacture comprising one or more recordable media, wherein the one or more recordable media is hardware, storing instructions which, when executed by a processor of a video data decoder, cause the processor to perform a horizontal transform and a vertical transform on each row and column of an 8x8 block of scaled transform coefficients, using a one-dimensional inverse transform, in a manner using a sequence of only addition, subtraction and shift operations, wherein basis vectors of the vertical and horizontal transforms comprise the following five column vectors:

$$\begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 1/2 \\ -1/2 \\ -1 \\ -1 \\ -1/2 \\ 1/2 \\ 1 \end{bmatrix}, \begin{bmatrix} 10/8 \\ -3/8 \\ -12/8 \\ -6/8 \\ 6/8 \\ 12/8 \\ 3/8 \\ -10/8 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \\ -1 \\ 1 \\ 1 \\ -1 \\ -1 \\ 1 \end{bmatrix} \text{ and } \begin{bmatrix} 6/8 \\ -12/8 \\ 3/8 \\ 10/8 \\ -10/8 \\ -3/8 \\ 12/8 \\ -6/8 \end{bmatrix}.$$

70. (Currently Amended) The decoding method according to claim 69, wherein the basis vectors are:

$$\begin{bmatrix} 1 & 12/8 & 1 & 10/8 & 1 & 6/8 & 1/2 & 3/8 \\ 1 & 10/8 & 1/2 & -3/8 & -1 & -12/8 & -1 & -6/8 \\ 1 & 6/8 & -1/2 & -12/8 & -1 & 3/8 & 1 & 10/8 \\ 1 & 3/8 & -1 & -6/8 & 1 & 10/8 & -1/2 & -12/8 \\ 1 & -3/8 & -1 & 6/8 & 1 & -10/8 & -1/2 & 12/8 \\ 1 & -6/8 & -1/2 & 12/8 & -1 & -3/8 & 1 & -10/8 \\ 1 & -10/8 & 1/2 & 3/8 & -1 & 12/8 & -1 & 6/8 \\ 1 & -12/8 & 1 & -10/8 & 1 & -6/8 & 1/2 & -3/8 \end{bmatrix}$$

or multiples thereof or a transpose thereof.

Allowable Subject Matter

2. The following is an examiner's statement of reasons for allowance:

Claims 31, 33, 37, 39, 41, 43 and 45 are allowable for the same reasoning indicated in the prior office action. While some limitations have been deleted from these claims, the limitations drawn to the allowable subject matter remains and the deletions

do not affect the reasoning for allowance indicated in the prior office action. Accordingly, claims 31, 33, 37, 39, 41, 43 and 45 now stand allowable.

New independent claims 65, 67 and 69 recite five of the eight basis vectors from the claims discussed above. The prior art fails to provide for these five basis vectors for the same reasoning that the prior art fails to provide for the eight basis vectors in the other claims; while the prior art discussed in the prior office action provides for "similar" basis vectors, no found prior art teaches the same basis vectors and it would not have been obvious to modify the basis vectors in the prior art to arrive at those claimed herein. Accordingly, claims 65, 67 and 69 stand allowable, and claims 66, 68 and 70, depending from claims 65, 67 and 69 are also allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL ZEILBERGER whose telephone number is (571)270-3570. The examiner can normally be reached on M-F 8:00-4:30pm est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571)272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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